

ART. VII.—*Notes and Descriptions of Lepidoptera.*

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Communicated by G. V. Hudson, F.E.S.

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THE following notes on new and interesting forms are based mainly on material received through the kindness of Messrs. G. V. Hudson and A. Philpott, principally collected in the southern parts of the South Island. It is evident that the fauna is still far from being exhausted. I think that good results might be especially obtained by (1) searching for, and particularly breeding, the more minute forms, which require close observation, and (2) collecting at high altitudes earlier, and perhaps also later, in the year.

## CARADRINIDÆ.

*Leucania temenaula*, n. sp.

♂. 34–36 mm. Head and thorax greyish-ochreous mixed with brownish. Antennæ serrate, fasciculated. Forewings elongate-triangular, costa almost straight or subsinuate, termen bowed, waved, oblique; greyish-ochreous, mixed with whitish-grey and brownish; subbasal, first, second, and subterminal lines obscurely pale or whitish, inconspicuous, more or less partially dark-edged interiorly, sometimes with some black irroration; orbicular and reniform more or less distinctly whitish-edged and laterally dark-margined, orbicular round, reniform trapezoidal; claviform small, whitish, dark-edged, touching first line, sometimes obsolete; median line obsolete; three pale dots on costa posteriorly; a terminal series of dark-fuscous crescentic marks. Hindwings fuscous, with dark-fuscous terminal line; cilia whitish, base fuscous-tinged.

Rakaia (Fereday), Dunedin (Hudson); three specimens. A distinct though inconspicuous species, allied to *moderata*, but lighter and less uniform in colouring, spots more distinct, termen rather more oblique, hindwings much less dark posteriorly.

*Leucania pachyscia*, n. sp.

♀. 32–40 mm. Head and thorax grey-whitish mixed with dark fuscous, thorax sometimes with blackish anterior angulated bar. Forewings elongate-triangular, costa almost straight, termen bowed, waved, oblique; whitish, sprinkled with brownish and black scales; subbasal line partially margined with dark

fuscous; first and second lines indicated by dark-fuscous interior margins; spots indicated by partial dark-fuscous margins, orbicular roundish, reniform trapezoidal, claviform suboval; median shade more or less marked, formed by dark-fuscous suffusion; subterminal line indicated by well-marked thick dark-fuscous anterior margin; a terminal series of dark-fuscous crescentic marks: cilia whitish, with distinct bars of blackish irroration. Hindwings whitish-fuscous, with suffused fuscous terminal fascia; cilia whitish, base more or less infuscated.

Mount Arthur (4,700 ft.) and Lake Wakatipu, in January; two specimens. Easily known by the whitish ground-colour and strong dark præsubterminal shade.

## HYDRIOMENIDÆ.

*Chloroclystis halianthes*, n. sp.

♂. 26–27 mm. Head, palpi, and thorax fuscous mixed with whitish and dark fuscous, shoulders partially suffused with red; palpi  $2\frac{1}{2}$ . Antennæ biciliated with long fascicles. Forewings triangular, costa posteriorly arched, termen little bowed, oblique, subsinuate above tornus; pale fuscous mixed with white and dark fuscous, sometimes partially suffused with pale red, appearing purplish-tinged; normal fasciæ formed of blackish irroration; median band broad, anterior edge hardly curved, below middle sometimes largely suffused with white and partially with pale red, posterior edge running from before  $\frac{3}{4}$  of costa to tornus, very obtusely angulated below middle, followed by well-marked pale double second line; fifth and sixth fasciæ little marked, below middle obsolete through contraction of area: cilia fuscous mixed with whitish, distinctly barred with dark fuscous. Hindwings with termen tolerably evenly rounded, hardly prominent on vein 3; pale-grey, towards dorsum sprinkled with black and white.

Lake Wakatipu (Hudson); two specimens. Of the New Zealand species of this genus that have fasciculate antennæ in ♂, *muscosata*, *antarctica*, and *bilineolata* are green-tinged species, *dryas* a clear brown species, *plinthina* and *aristias* are red-tinged species: *halianthes* is really red-tinged, but appears purplish, and is allied to the two latter, but larger than either, darker, and easily known by the grey hindwings (in the other two whitish) and differently formed median band of forewings. Probably it varies considerably, like several of the others.

*Asaphodes stephanitis*, n. sp.

♂. 26–27 mm. Head and thorax yellow-ochreous, with a few blackish scales. Forewings triangular, costa gently arched, termen bowed, oblique, slightly waved; clear light yellow-

ochreous; fasciæ formed by dentate striæ of blackish irroration, first and second separated by a suffused whitish line, second obsolete except on extremities; third reduced to a single curved stria, preceded by a white line, and followed by white suffusion above and below middle: fourth of three striæ, posterior edge with acute short triangular projection in middle, followed by a strong white line; fifth of two striæ, posterior sometimes very thick and suffused, followed by white subterminal line, sometimes partially obscured; sixth of one stria following subterminal line, terminated above by an oblique subapical suffusion; a blackish terminal line: cilia white, barred with blackish irroration. Hindwings light ochreous-yellow; terminal line and cilia as in forewings.

Invercargill, on sandhills (Philpott); two specimens received from Mr. Hudson. Recalls a small *Xanthorhoe clarata*, but the resemblance is only superficial.

*Xanthorhoe dionysias*, n. sp.

♂. 28 mm. Head, palpi, and thorax pale-ochreous tinged with brown-reddish. Forewings somewhat elongate-triangular, costa gently arched, subsinuate in middle, termen rather bowed, oblique, not waved; pale greyish-ochreous, towards costa suffusedly tinged with reddish-ochreous; basal area indistinctly striated with dark fuscous irroration; median band defined anteriorly by two curved similar striæ, posteriorly by three curved dark striæ enclosing two lines, first pale, second slightly tinged with reddish-ochreous; within median band are two suffused striæ connected by a transverse dark-fuscous discal dot, first obsolete in middle; terminal area irrorated with dark fuscous; an interrupted dark-fuscous terminal line: cilia pale-greyish-ochreous, barred with dark-fuscous irroration. Hindwings elongate, termen rounded, faintly waved; pale greyish-ochreous, thinly irrorated with grey; a blackish discal dot; a cloudy grey postmedian line; cilia pale greyish-ochreous mixed with grey.

Old Man Range, Dunedin (Lewis); one specimen received from Mr. Hudson. A distinct species, probably allied to *ægrotæ*, but not very nearly.

CRAMBIDÆ.

*Crambus apselias*, n. sp.

♂ 28-30 mm., ♀ 23 mm. Head ochreous-white, face rounded. Palpi  $4\frac{1}{2}$ -5, brownish-ochreous, internally and at base beneath white, in ♀ very slender. Antennæ in ♂ filiform, shortly ciliated. Thorax brownish-ochreous, with ochreous-white central stripe. Abdomen whitish-ochreous. Forewings

very elongate-triangular, costa posteriorly moderately arched, apex round-pointed, termen sinuate, oblique; shining brassy-ochreous; a moderate white longitudinal median streak from base, split into three branches posteriorly, and two similar detached branches above these; very indistinct narrow streaks of whitish suffusion towards costa between veins, in ♀ more suffused; two or three broader and sometimes confluent streaks of white suffusion towards dorsum between veins: cilia in ♂ whitish, on lower half of termen more or less suffused with ochreous, in ♀ white. Hindwings fuscous-whitish, in ♂ more fuscous-tinged towards apex; cilia in ♂ ochreous-whitish, in ♀ white.

Invercargill, in December; two specimens taken by myself, and three others received from Messrs. Philpott and Hudson. Closely allied to *ramosellus*, from which it is very easily separated by the entire absence of the black terminal dots and of the blackish inferior edging of the white median streak.

*Crambus conopias*, n. sp.

♂. 26 mm. Head white, with a central ochreous line, face forming a moderate conical projection. Palpi 5, brownish-ochreous, white at base and internally. Antennæ filiform, simple. Thorax light ochreous, with suffused whitish dorsal stripe. Abdomen whitish-ochreous. Forewings very elongate, narrow, somewhat dilated posteriorly, costa slightly arched, apex tolerably acute, termen hardly sinuate, oblique; pale brownish-ochreous; a moderate white longitudinal median streak from base to termen, posterior extremity angularly produced upwards on termen, margined with blackish suffusion above from  $\frac{1}{3}$  to near termen, and beneath almost from base to middle; veins posteriorly marked with some dark-fuscous scales; median and second lines indicated by angulated series of ill-defined dark-fuscous longitudinal marks on veins, obsolete near costa; terminal blackish dots on veins: cilia white, somewhat mixed with brownish-ochreous. Hindwings fuscous-whitish, more infuscated posteriorly; cilia white.

Dunedin (Lewis); one specimen received from Mr. Hudson. Apparently more allied to *ramosellus* than to any other New Zealand species, but very distinct by the frontal cone; there would seem to be undoubted affinity to the European *inquinatellus*.

*Tauroscopa glaucophanes*, n. sp.

♀. 29–31 mm. Head and palpi ochreous-whitish mixed with blackish, palpi  $3\frac{1}{2}$ ; a naked dark-grey space between eye and palpi. Thorax dark grey suffused with light bronzy-

blue-greenish, and mixed with ochreous-whitish and pale ochreous. Forewings elongate, moderate, slightly dilated, costa gently arched anteriorly, almost straight posteriorly, apex obtuse, termen rounded, somewhat oblique; dark grey, more or less mixed suffusedly with ochreous-whitish or whitish-ochreous, with a brassy-blue-greenish tinge; first and second lines pale, angulated, margined with darker shades, but sometimes almost wholly obsolete: cilia grey mixed with ochreous-whitish. Hindwings grey, lighter towards base, suffused with darker towards termen; cilia grey, tips whitish.

Lake Wakatipu, 4,000–5,000 ft. (Hudson); two specimens. Larger than the other two species, with the forewings much less triangular, rather oblong, and otherwise quite distinct.

#### PYRAUSTIDÆ.

##### *Scoparia xysmatias*, n. sp.

♂. 19 mm. Head dark fuscous. Palpi  $2\frac{1}{2}$ , dark fuscous, lower longitudinal half ochreous-whitish. Antennæ very minutely pubescent. Thorax dark fuscous, sprinkled with ferruginous scales. Forewings elongate, gradually dilated, costa almost straight, apex obtuse, termen faintly sinuate, rather oblique; dark fuscous, irregularly strewn except on margins with yellowish-ferruginous scales, and partially suffused with black, especially about margins of first and second lines and towards dorsum anteriorly; first and second lines represented by straight undefined series of whitish scales surrounded with yellowish-ferruginous suffusion, strongly converging towards dorsum; a small spot of white scales in middle of disc, followed by a black spot; a well-marked black fascia beyond second line; a few white scales indicating subterminal line: cilia ochreous-whitish, with dark-fuscous basal and grey median lines. Hindwings without hairs in cell; dark grey sprinkled with blackish; cilia ochreous-whitish, with dark-grey basal line.

Old Man Range, Dunedin (Lewis); one specimen received from Mr. Hudson. Probably intermediate between *hemicycla* and *ergatis*, but very distinct.

##### *Scoparia autochroa*, n. sp.

♂. 21–23 mm. Head and thorax brown, face dark fuscous. Palpi  $2\frac{3}{4}$ , pale brownish mixed with dark fuscous, base whitish. Antennæ dark fuscous, ciliations  $\frac{2}{3}$ . Abdomen fuscous. Forewings elongate-triangular, costa hardly arched, apex obtuse, termen little rounded, somewhat oblique; brown sprinkled with rather dark fuscous: cilia pale brownish, with rather

dark fuscous subbasal line. Hindwings without hairs in cell; fuscous; cilia light greyish-ochreous, with fuscous subbasal line.

Invercargill, in open swampy situations, in November (Philpott, Hudson); three specimens. Very distinct, of somewhat doubtful affinity, possibly nearest *encapna*.

*Scoparia choristis*, n. sp.

♂. 17 mm. Head and thorax fuscous, somewhat whitish-sprinkled. Palpi  $2\frac{1}{4}$ , fuscous, basal area white beneath, edged with dark fuscous. Antennal ciliations  $\frac{1}{2}$ . Forewings elongate-triangular, costa posteriorly moderately arched, termen slightly sinuate, rather oblique; white, thinly sprinkled with fuscous; base suffused with fuscous, with a few black scales, and a short very oblique black streak from base of costa; first line white, undefined anteriorly, posteriorly edged by a black streak from  $\frac{1}{3}$  of costa to  $\frac{2}{5}$  of dorsum, rather curved near costa, followed by an undefined band of fuscous suffusion; discal spot 8-shaped, faintly outlined with fuscous; second line slender, white, from beyond  $\frac{3}{4}$  of costa to dorsum near tornus, edged anteriorly with fuscous irrorated with black, subsinuate inwards near costa and outwards near dorsum and very obtusely angulated above middle; terminal area fuscous mixed with blackish, subterminal line represented by some whitish suffusion towards apex, and an oblique suffused white bar below middle; a terminal series of cloudy whitish dots. Hindwings without hairs in cell; light grey with brassy reflections, paler towards base; cilia whitish, with two pale-grey shades.

Kaitoke, Wellington, in November (Hudson); one specimen. Very similar to *colpota*, but immediately distinguished by quite different form of second line, especially by the peculiar outward sinuation near dorsum; also allied to *periphanes*, in which, however, the lower half of second line is straight and oblique.

*Scoparia asaleuta*, n. sp.

♀. 21–23 mm. Head, palpi, and thorax prismatic bronzy-grey, suffusedly irrorated with white; palpi  $2\frac{1}{4}$ . Antennæ dark grey, suffusedly ringed with white. Abdomen pale ochreous, sprinkled with grey. Forewings very elongate, narrow, posteriorly dilated, costa subsinuate in middle, slightly arched posteriorly, apex obtuse, termen nearly straight, hardly oblique, rounded beneath; iridescent pale ochreous mixed with dark bluish-grey, wholly suffused or densely irrorated with white except dark markings as under—viz., an undefined subbasal fascia; a nearly direct fascia representing first line, dilated posteriorly above middle; an 8-shaped discal mark; a broad



terminal fascia, on which the second and subterminal lines appear as whitish shades confluent in middle and sometimes partially obsolete: cilia whitish-ochreous, tips whitish, with narrow basal and broader postmedian grey shades. Hindwings without hairs in cell; pale greyish-ochreous, with suffused dark-grey terminal fascia; cilia ochreous-grey-whitish, with grey basal line.

Lake Wakatipu (Hudson); two specimens. An elegant species, intermediate between *cataresta* and *tetracyla*; to the naked eye obviously bluish-tinged.

*Scoparia augastis*, n. sp.

♂. 28-29 mm. Head fuscous, crown mixed with whitish. Palpi 3, fuscous, base white. Antennæ fuscous, ciliations  $\frac{1}{2}$ . Thorax light fuscous. Abdomen pale greyish-ochreous. Forewings very elongate, gradually dilated, costa posteriorly gently arched, apex obtuse, termen faintly sinuate, rather oblique; rather light fuscous, more or less irrorated finely with whitish; costa and all veins marked by more or less distinct somewhat darker fuscous lines: cilia whitish, with two fuscous lines, anterior interrupted. Hindwings with long hairs in cell; very pale brassy-ochreous; cilia whitish, with very faint greyish subbasal line.

Invercargill, in March, on flowers of *Senecio* after dark (Philpott); three specimens. Very distinct, perhaps nearest to the Australian *nephelitis*.

#### PTEROPHORIDÆ.

*Platyptilia campsiptera*, n. sp.

♂. 17 mm. Head and thorax yellowish-white, metapleura with an oblique black streak, frontal cone of scales moderately long. Palpi  $3\frac{1}{2}$ , white, apical  $\frac{2}{3}$  externally irrorated with dark fuscous. Abdomen pale whitish-yellow, with a black lateral dot near base, and a few black lateral scales posteriorly. Legs white, banded with dark fuscous. Forewings cleft from  $\frac{3}{4}$ , upper segment rather narrow, apex produced, pointed, lower segment much broader, posteriorly dilated; whitish, tinged with pale yellow; costa towards base shortly strigulated with fuscous irroration; a small triangular fuscous spot irrorated with dark fuscous on costa before fissure, not reaching across first segment, and a smaller similar mark on costa between this and apex: cilia ochreous-whitish, spotted with fuscous round lower angle of first segment, and upper angle and termen of second, with a small black scale-tooth on dorsum at  $\frac{2}{3}$ . Hindwings reddish-fuscous; cilia whitish, slightly reddish-tinged, with a blackish basal mark on lower half of termen of first segment, and mere traces of black scales in middle of dorsum of third segment.

Humboldt Range, Lake Wakatipu, at 3,600 ft. (Hudson). Mr. Hudson writes: "In this species the second digit of the forewing is held almost at right angles pointing downwards from the first digit during life; after death the digit assumes the normal position." This would appear to be a very singular characteristic, which would repay further investigation. The species is allied to *deprivatalis*, but very distinct.

*Platytilia deprivatalis*, Walk. 946.

This name supersedes *Haasti*, Feld.; I have examined the types.

#### TORTRICIDÆ.

*Epagoge*, Hb.

This genus, which differs from *Capua* only by the absence of the costal fold in ♂, has not been hitherto known from New Zealand, but is well represented in Australia.

*Epagoge cyclobathra*, n. sp.

♂ ♀. 16–18 mm. Head, palpi, and thorax rather dark fuscous. Abdomen pale grey. Forewings elongate, suboblong, costa moderately arched, apex obtuse, termen hardly rounded, rather oblique; fuscous, slightly purplish-tinged, sprinkled with dark fuscous, towards middle of costa suffused with dark ashy-fuscous, towards termen mixed with reddish-ochreous and strigulated with dark fuscous; basal  $\frac{2}{3}$  whitish-ochreous, marked with several deeper ochreous striæ, outer edge curved; within this patch an irregular dark-fuscous streak from base of dorsum along costa to  $\frac{1}{4}$ , thence proceeding as a curved transverse streak to submedian fold: cilia grey, with dark fuscous median line. Hindwings light grey; cilia whitish-grey, with darker subbasal line.

Invercargill, in December and January (Philpott); two specimens.

*Trachybathra*, n. g.

Antennæ in ♂ moderately biciliated. Palpi moderate, prorected, rough-scaled above and beneath. Thorax smooth. Forewings with rough scales at base, in ♂ with costal fold; 2 from  $\frac{2}{3}$ . 7 and 8 stalked, 7 to termen, 11 from middle. Hindwings with vein 4 absent, 6 and 7 stalked.

Allied to *Capua*, from which it differs by the rough basal scales of forewings, and the absence of vein 4 of hindwings.

*Trachybathra scoliastis*, n. sp.

♂. 18 mm. Head, palpi, and thorax brownish irrorated with grey-whitish and dark fuscous. Abdomen fuscous. Forewings



elongate, hardly dilated, costa slightly bent before middle, apex obtuse, termen faintly sinuate beneath apex, bowed, oblique; pale brownish, partially suffused irregularly with whitish, costa and dorsum strigulated with dark fuscous; outer edge of basal patch indicated by a blackish line in disc, obsolete towards extremities: an irregular incurved fuscous streak marked with black from  $\frac{2}{5}$  of costa to below middle of disc, followed by whitish suffusion; an irregular dark-fuscous spot above tornus, and some dark-fuscous strigulae towards lower part of termen: cilia grey-whitish mixed with dark grey. Hindwings fuscous, strigulated with darker; some undefined ochreous-yellowish suffusion in centre of disc and towards costa in middle: cilia pale grey, with dark-grey subbasal line.

Lake Wakatipu (Hudson); one specimen.

*Pyrgotis tornota*, n. sp.

♀. 18 mm. Head and thorax pale ochreous sprinkled with dark ferruginous. Palpi  $2\frac{1}{2}$ , whitish-ochreous, irrorated with dark ferruginous. Abdomen pale whitish-ochreous. Forewings elongate, posteriorly somewhat dilated, costa strongly arched towards base, faintly sinuate in middle, posteriorly almost straight, apex obtuse, termen concave, little oblique; reddish-brown, suffusedly mixed with pale leaden-grey, and strigulated with whitish-yellowish; a few minute dots of blackish scales, especially on dorsum; a moderately broad curved darker streak, suffusedly irrorated with yellow-ochreous, from  $\frac{1}{3}$  of costa to below middle of disc, thence curved evenly upwards, confluent towards costa with a round similar blotch on middle of termen, so that the ground-colour appears to form a narrow whitish-edged projection upwards between them: cilia reddish-brown, darker towards apex, tips whitish-ochreous. Hindwings whitish, with a few grey strigulae on dorsal half; cilia whitish.

Invercargill, in August (Philpott); one specimen. The whitish hindwings are a special characteristic.

*Adoxophyes conditana*, Walk.

I have received from Mr. Philpott three examples of a curious melanic form of the male of this species, stated to be common near Invercargill. The forewings are mainly suffused with dark purplish-grey irrorated or strigulated with blackish, except some small variable whitish spots towards middle of dorsum and sometimes towards apex and termen; whilst the hindwings are densely irrorated with blackish. I at first thought it a distinct species, but after careful comparison with my long series of varieties of this extraordinarily variable species am satisfied that it is only a melanic southern form; I have not

however, yet seen the corresponding females. Several other species from Invercargill show the same tendency to melanism, which should be borne in mind when considering insects from that region.

*Cacoecia acrocausta*, n. sp.

♂. 19–21 mm. Head and thorax brownish-ochreous or yellow-ochreous. Palpi 3, fuscous, externally suffused with ferruginous. Antennal ciliations  $1\frac{1}{2}$ . Abdomen whitish-ochreous, beneath ferruginous, and tuft mixed with dark grey. Forewings elongate-triangular, costa slightly arched, apex obtuse, termen rounded, little oblique; whitish-ochreous or yellow-ochreous, with scattered blackish-grey strigulae, basal  $\frac{3}{4}$  more or less tinged or suffused with brown; costal edge ferruginous; cilia whitish-ochreous, on upper half of termen dark grey, on costa yellowish-ferruginous. Hindwings ochreous-whitish, strigulated with pale grey, more distinctly towards base; cilia ochreous-whitish.

♀. 22 mm. Head and thorax whitish. Palpi  $3\frac{1}{2}$ , ochreous-whitish, externally fuscous-sprinkled. Forewings more elongate than in ♂, ochreous-whitish, sprinkled with very pale fuscous; central fascia indicated by an undefined grey very zigzag shade; a small grey spot towards termen in middle; cilia whitish-ochreous, becoming fuscous on upper part of termen. Hindwings as in ♂.

I took a male and female together at Christchurch in September, but had not ventured hitherto to describe them; I have now received four additional males from Mr. Philpott, taken at Invercargill, where the species is common in October and November. It is allied to *excessana*, but quite distinct.

*Cacoecia orthropis*, Meyr.

Examples from Invercargill sent by Mr. Philpott have the forewings much greyer than Christchurch and Wellington specimens, and the hindwings are also grey; they appear to constitute a geographical form only, and to afford an instance of the tendency to a darker colouring mentioned above.

*Tortrix molybditis*, n. sp.

♂. 12 mm. Head and palpi rather dark fuscous, palpi 2. Antennal ciliation 1. Thorax dark glossy leaden-fuscous. Abdomen dark fuscous. Forewings elongate, posteriorly dilated, costa gently arched, apex obtuse, termen straight, rather oblique; rather dark glossy leaden-grey; markings blackish-fuscous; four small spots on costa alternating with principal markings; a stria marking outer edge of basal patch, strongly angulated in

middle; a small spot of pale-yellowish projecting scales on dorsum near base; upper half of central fascia well marked, lower half obsolete; a small triangular costal patch, from near which proceed two irregular striae to tornus and lower part of termen, edged with a few pale-yellowish scales: cilia dark fuscous, tips paler. Hindwings dark fuscous; cilia pale-greyish, with dark-grey basal line.

Wellington (Hudson); one specimen. Very distinct; has some superficial resemblance to *Dipterina hemiclista*, but easily distinguished by the short antennal ciliations.

*Eurythecta paraloza*, n. sp.

♂. 12-13 mm. Head and thorax whitish-ochreous, more or less suffused with ferruginous, with a few black scales. Abdomen dark fuscous, apex pale ochreous. Forewings elongate, rather narrow, costa somewhat arched anteriorly, apex obtuse, termen somewhat rounded, oblique; vein 7 present; ochreous-whitish, more or less suffused with yellow-ochreous, palest on costa; markings yellow-ochreous or ferruginous, variably mixed with dark fuscous; basal patch darkest towards outer edge, which is oblique, rounded-prominent in middle, more or less excavated beneath this; central fascia moderate, anterior edge nearly straight, posterior edge irregularly prominent below middle, so as to appear concave on upper half; four small spots on costa posteriorly, first three sometimes confluent into a small triangular blotch; an irregular blotch along termen: cilia ochreous-whitish, more or less distinctly barred with dark fuscous. Hindwings dark grey; cilia grey.

Invercargill, common on sandhills in January (Philpott); three specimens. This species differs from the other two in having vein 7 of forewings present; but as it possesses the other characteristic structural points of the genus, and is obviously nearly allied in all respects, it seems unnecessary to form a new genus for its reception. The genus is a development of *Proselena*, and the present species is an early form of it.

*Prothelymna niphostota*, n. sp.

♂. 15 mm. Head whitish. Palpi, thorax, and abdomen pale fuscous. Forewings elongate, costa moderately arched, apex obtuse, termen slightly rounded, oblique; white; basal patch pale fuscous, marked with spots of blackish irroration; dorsal half from this to tornus marked with coarse grey strigulae irrorated with black; an oblique grey patch on middle of costa; a smaller dark-grey spot on costa at  $\frac{3}{4}$ ; a grey apical patch, marked with coarse blackish-grey strigulae, and extended as an irregular subterminal stria to tornus: cilia whitish, round

apex greyish-tinged and spotted with blackish irroration. Hindwings pale grey, veins partially dark grey; cilia grey-whitish.

Invercargill, in January (Philpott); one specimen. This, the second known species of the genus, is easily known from the other by the white ground.

#### PHALONIADÆ.

##### *Heterocrossa iophaea*, n. sp.

♀. 18–19 mm. Head, palpi, and thorax dark fuscous irrorated with whitish, face and palpi internally pale ochreous, palpi 4. Abdomen grey, two basal segments whitish-ochreous. Forewings elongate, narrow, costa gently arched, apex round-pointed, termen almost straight, oblique; dark fuscous irrorated with whitish, sometimes more or less mixed with pale ochreous; a series of small dark spots along costa; tufts brownish-ochreous suffusedly edged with black and posteriorly margined with whitish, viz., two near base sometimes surrounded with ochreous suffusion, a transverse angulated series beyond  $\frac{1}{4}$ , and five arranged round middle of disc, enclosed space sometimes blackish; a more or less defined angulated dark subterminal line: cilia rather dark fuscous irrorated with whitish. Hindwings grey; cilia whitish-grey.

Invercargill, amongst bush, from October to February (Philpott); four specimens. Much the darkest species of the genus.

##### *Heterocrossa gonosemana*, Meyr.

Further material has convinced me that *epomiana*, Meyr., is only a variety of this species, and must sink accordingly.

#### GELECHIADÆ.

##### *Gelechia acrodactyla*, n. sp.

♂. 15–17 mm. Head whitish-ochreous. Palpi ochreous-whitish; basal joint, lower third of second joint, and subapical ring of terminal joint dark fuscous. Antennæ serrulate, pubescent, pale ochreous dotted with dark fuscous. Thorax whitish-ochreous, tinged or irrorated with brownish. Abdomen grey. Forewings elongate, narrow, costa gently arched, apex obtuse, termen rounded, rather strongly oblique; whitish-ochreous, irregularly irrorated with brown; plical and first discal stigmata rather large, blackish, plical rather before first discal; brown irroration forms a suffused costal patch beyond middle, and a narrow terminal fascia; cilia whitish-ochreous, with dark-grey subbasal line. Hindwings over 1, grey; cilia pale whitish-ochreous, with grey subbasal line.

Invercargill, amongst bush, local, in November (Philpott); three specimens. Allied to *achyrotæ*, but, apart from other characters, *achyrotæ* has two blackish rings on terminal joint of palpi, *acrodactyla* only one.

CECOPHORIDÆ.

*Borkhausenia armigerella*, Walk.

Specimens sent by Mr. Philpott from Invercargill, in conjunction with the material already possessed, appear to show conclusively that *actinias*, Meyr., is only a strongly marked form of this species, and the name should therefore be reduced to a synonym.

*Borkhausenia perichlora*, n. sp.

♂. 21-22 mm. Head whitish-ochreous mixed with fuscous. Palpi whitish-ochreous, irrorated throughout with rather dark fuscous. Antennæ dark fuscous. Thorax dark fuscous, apical half of patagia yellow-ochreous. Abdomen grey. Forewings elongate, costa gently arched, apex round-pointed, termen very obliquely rounded; ferruginous-brown, towards costa somewhat paler and more ochreous; a yellow-ochreous streak along dorsum from base to near tornus posteriorly whitish, upper edge triangularly indented before middle, with some blackish scales in indentation; cilia ferruginous-ochreous. Hindwings light grey, margins narrowly whitish; cilia whitish.

Invercargill, abundant among *Leptospermum*, in November and December (Philpott); three specimens. At first sight very similar to *basella*, but with termen of forewings more oblique, and easily distinguished by the fuscous-mixed head, uniformly infuscated palpi, and whitish cilia of hindwings.

*Borkhausenia basella*, Walk. (*Incurvaria basella*, Walk. 492; *Cecophora ademptella*, ib. 698.)

♂. 18-21 mm. Head ochreous-yellow. Palpi ochreous-yellow, second joint except apex, and subbasal and subapical rings of terminal joint dark fuscous. Antennæ dark fuscous. Thorax dark brown, apex of patagia and a posterior spot ochreous-yellow. Abdomen fuscous. Forewings elongate, costa moderately arched, apex obtuse, termen almost straight, oblique; ochreous-brown irrorated with darker, with a slight purplish gloss; costal edge finely ochreous-yellow except towards base; a whitish-yellowish streak, partly suffused with deep ochreous-yellow, along dorsum from base to  $\frac{3}{4}$ , upper edge broadly triangularly indented before middle, with a blackish dot in in-

dentation: cilia brown, irrorated with darker. Hindwings and cilia fuscous-grey.

Wellington (Hudson); six specimens. Distinguished by the uniform dark colouring and pale dorsal stripe; *phogophylla*, Meyr., is very similar, but much brighter-coloured, and has terminal joint of palpi wholly yellow, without dark fuscous rings; *politis*, Meyr. (of which I have both sexes) is much more mottled in appearance, with dark stigmata and subterminal line always apparent, and (though occurring in the same neighbourhood) truly distinct, since the antennal ciliations of ♂ are appreciably longer, obviously over 1, whilst in *basella* they are only 1.

*Borkhausenia pronephela*, n. sp.

♂. 16–17 mm. Head and thorax ochreous-yellowish. Palpi light yellowish, lower half of second joint dark fuscous. Antennæ dark fuscous. Abdomen grey. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen rounded, rather strongly oblique; yellow-ochreous; a pale yellow dorsal streak from base to near tornus; basal third of wing suffused with brown or dark fuscous except on dorsal streak which is indented by the dark colouring before middle, indentation partially whitish-edged and containing a blackish mark; two ill-defined fasciæ of fuscous suffusion from middle of dorsal streak and tornus respectively, meeting on middle of costa; stigmata cloudy, dark fuscous, plical beneath first discal; some dark fuscous scales indicating an angulated subterminal line; cilia yellow-ochreous mixed with fuscous, with a fuscous postmedian shade. Hindwings grey; cilia whitish-grey.

Invercargill, on outskirts of bush, in December (Philpott); three specimens. A distinct species, intermediate between the *basella* and *griseata* groups.

PLUTELLIDÆ.

*Glyphipteryx metasticta*, n. sp.

♂ ♀. 11–12 mm. Head and thorax bronzy-fuscous sprinkled with dark fuscous. Palpi ochreous-whitish, with two rings on second joint, and two rings and an anterior streak on apical portion of terminal joint blackish. Antennæ dark fuscous. Abdomen fuscous. Forewings elongate, rather narrow, costa moderately arched, apex round-pointed, termen very obliquely rounded; 7 and 8 stalked; in ♂ ochreous-fuscous, sometimes partly suffused with bronzy-ochreous, in ♀ dark fuscous with a cloudy whitish streak along dorsum



and posterior half obscurely marked with undefined whitish strigulae, partly edged with blackish; second discal stigma round, blackish, sometimes with a smaller similar dot before and above it; two or three short whitish strigulae from costa posteriorly, in ♂ very undefined, in ♀ longer and blackish-edged: cilia fuscous, on termen white with a blackish basal line. Hindwings and cilia rather dark grey, darker in ♀.

Invercargill, in damp situations on sandhills, in October (Philpott); three specimens. A distinct species, allied to the following.

*Glyphipteryx aulogramma*, n. sp.

♀. 15–16 mm. Head and thorax light shining bronzy-ochreous. Palpi ochreous-whitish, second joint with two black subapical rings, terminal joint with black anterior line. Antennae and abdomen dark fuscous. Forewings elongate, narrow, costa gently arched, apex acute, termen faintly sinuate, very oblique; 7 and 8 stalked; light shining bronzy-ochreous: costal edge whitish towards middle; a whitish-ochreous streak along submedian fold from  $\frac{1}{4}$ , variably extended posteriorly, and sometimes undefined whitish streaks on veins posteriorly, the interspaces sometimes fuscous-tinged; five silvery-grey-whitish fuscous-edged diversely oblique streaks from posterior half of costa, and two from about tornus, first costal connected with first tornal by some black scales, second tornal partly black-edged and subconfluent with fourth costal in a straight line: cilia ochreous-whitish. Hindwings dark grey, posteriorly blackish-irrorated; cilia grey, round costa and apex grey-whitish.

Invercargill, in damp situations on sandhills, in October (Philpott): two specimens. Allied to *transversella*, Walk., but a much less brilliant insect.

*Simaethis exocha*, n. sp.

♂. 20 mm. Head, palpi, and thorax grey-whitish mixed with blackish. Antennae pale grey, ringed with blackish. Abdomen fuscous, segmental margins mixed with whitish. Forewings elongate, moderate, posteriorly rather dilated, costa gently arched, apex obtuse, termen faintly sinuate, oblique; 7 and 8 connate; olive-fuscous, costa and dorsum broadly suffused with dark fuscous; basal area irrorated with whitish except a narrow fascia preceding first line; first line whitish, acutely angulated near costa, followed by a very irregular fascia of whitish irroration, which sends a triangular projection above middle to centre of disc; second line white, sharply defined, running from middle of costa to  $\frac{3}{4}$  of disc, thence acutely angulated to beyond middle of dorsum, somewhat sinuate inwards towards

costa and dorsum; an evenly broad fascia of white irroration from  $\frac{1}{5}$  of costa to  $\frac{1}{5}$  of dorsum, resting on second line in discal portion, terminating in a white spot on costa, and edged with a white line from this to angle of second line: cilia grey mixed with whitish, and indistinctly barred with dark fuscous irroration. Hindwings grey, darker posteriorly; indications of a cloudy whitish dot towards termen below middle; cilia grey mixed with whitish, with dark grey basal line.

Humboldt Range, Lake Wakatipu, at 3,600 ft. (Hudson); one specimen. This large and interesting form is allied to *combinatana*, Walk., but very distinct.

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ART. VIII.—*The Increase of Nitrogen in certain Soils due to Nitroculture.*

By A. M. WRIGHT, F.C.S. (Berlin), M.Am.C.S.

[*Read before the Philosophical Institute of Canterbury, 14th November, 1906.*]

THIS paper is the record of an attempt to determine what increase of nitrogen takes place in soils which have grown a leguminous crop, with and without the aid of nitro-culture, and with and without the addition of sulphate of potash and superphosphate.

The nitro-culture was obtained from the United States Department of Agriculture, the experiments being carried out with the garden-pea grown on various soils.

Three soils were experimented with, about 1,500 grams of soil being used in each pot.

The following are the conditions under which each soil was treated and cultivated:—

Experiment 1. The crop grown without fertiliser or nitro-culture.

Experiment 2. The crop grown with 1 gram sulphate of potash added to the soil.

Experiment 3. The crop grown with 1 gram sulphate of potash and 1 gram superphosphate added to the soil.

Experiment 4. The crop grown with the seed inoculated with nitro-culture.

Experiment 5. The crop grown with the soil inoculated with nitro-culture.

Experiment 6. The crop grown with the seed inoculated with nitro-culture and 1 gram sulphate of potash added to the soil.

Experiment 7. The crop grown with the seed inoculated with nitro-culture and 1 gram of sulphate of potash and 1 gram superphosphate added to the soil.